

THE HEAVENS IN MAY.

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All other astronomical events of May are incomparably surpassed in importance by the total eclipse of the sun on the 28th, which is of additional interest to us because it is visible in the United States. Though such eclipses occur at some part of the earth's surface rather oftener than once in two years, on the average, the path of the moon's shadow is so narrow that it passes much more rarely through any given region. Only three other total eclipses have been visible in the Eastern States during the present century—in 1806, 1834 and 1869.

The path of totality in the present eclipse begins in the Pacific Ocean, crosses Mexico and the extreme southern corner of Texas, passes out into the Gulf, and enters the United States again near New Orleans, whence it passes in an almost straight line to Norfolk, Va., and out to sea, as may be observed in the map published in the *SCIENTIFIC AMERICAN* of April 21, 1900.

Crossing the Atlantic almost on the track of the Mediterranean steamers, it transverses the Spanish peninsula, crosses to Algiers, and follows the north coast of Africa into the Tiberian desert.

The shadow-path in the United States is about 50 miles wide. Its central line passes about 10 miles north of New Orleans, 25 miles north of Mobile, Ala., 10 miles north of Columbus, Ga., 5 miles south of Greensboro, Ga., Newberry, S. C., and Wadesboro, N. C., and 15 miles south of Raleigh, N. C., and Norfolk, Va.

These details are given in order to enable the approximate construction of the eclipse track on any convenient map. The duration of totality in the United States varies from 1 minute 10 seconds at New Orleans to 1 minute 40 seconds at Norfolk.

Numerous astronomical expeditions will, of course, be sent to observe the eclipse, and the chances of fair weather at different stations have been carefully considered, and the most favorable ones chosen. The principal work will consist of photographs and drawings of the corona and prominences, and observations of the spectra of the corona and the lower layers of the solar atmosphere.

For those to whom the eclipse is a magnificent spectacle, rather than an occasion for scientific work, the most striking phenomena will be the onrush of the moon's shadow with the tremendous velocity of 2,000 miles an hour, the sudden darkness, and the appearance of the corona surrounding the black disc of the moon.

At the time of eclipse Mercury is about 2° west of the sun, and Aldebaran about 6° S.S.E. Both should be visible during totality. Venus will be too near the eastern horizon, as seen from stations in this country, to be conspicuous.

For those outside the track of the shadow, the partial phase of the eclipse will still be well worth looking at. Along the coast near New York about nine-tenths of the sun will be hidden, and the decrease of light will be conspicuous, the sun appearing through smoked glass as a narrow crescent.

However, since even one-tenth of sunlight is some 60,000 times as bright as the strongest moonlight, day will by no means be turned into night for New York, even at the time of greatest eclipse.

THE HEAVENS.

At 10 P. M., in the middle of May, the splendid constellations which make the evening sky of April the most brilliant of the year have all set except Gemini in the west and Auriga in the northwest. Before the brightest star, Capella, of the latter constellation, is lost from the evening skies, it is worth while to note that it has recently been shown by spectroscopic evidence to be double, consisting of two components of almost equal brightness which revolve about one another in an orbit comparable in size with the earth's in a period of about 100 days.

This "spectroscopic binary" is unusually interesting since on account of its relative nearness to the earth there is reason to hope that its components may be separated visually with the aid of the greatest of present-day telescopes, thus giving us an accurate knowledge of its mass and distance.

Leo is high in the west, and the Great Bear between him and the pole. Almost overhead shines Arcturus, and on the east is the semicircle of the Northern Crown, while further south, and near the meridian is Virgo, marked by the white star Spica.

The Milky Way lies low along the eastern horizon, with several fine constellations near its course.

In the northeast is the cross of Cygnus, now prone upon its side, and above is the blue-white Vega. Just rising in the east is Altair and in the southeast Scorpio lifts his claws well above the horizon, and the red Antares blazing in his heart, though his long curving tail is still out of sight.

THE PLANETS.

Mercury is morning star during the earlier part of the

month, but too near the sun to be well seen. It passes superior conjunction on the 29th, and changes from morning to evening star. During the eclipse of the 28th it will be conspicuous some 2° west of the sun. Observations of its brightness at this time are planned by some observers, who will take advantage of the eclipse to observe it much nearer the full phase than has ever been done before.

Venus is evening star in Gemini, setting nearly four hours after the sun on the 1st, and about two and a half hours after sunset on the 31st. It is apparently approaching the sun, and is in reality rushing forward to come almost between the earth and sun next July.

Its greatest brightness occurs on the 31st, when it is fully one hundred times as bright as an average first magnitude star. Toward the end of the month its crescent phase will be visible in a good field-glass, especially during twilight, when the glare of the planet is diminished.

Mars is morning star in Pisces and Aries, rising about an hour and a half before sunrise, and very unfavorably placed for observation.

Jupiter is in Ophiuchus, north of Antares, and moves westward about 5° during the month. It comes into opposition on the 27th, rising about 7 P. M., but is in an unfavorable position on account of its great south declination.

The same statement applies with even greater force to Saturn, which is in Sagittarius, some 30° east of Jupiter, and about as far south as it can possibly get. It rises about 11 P. M. at the beginning of the month, and 9 P. M. at the close.

Uranus is in the Scorpio, about 2½° east and 1° south of Jupiter on the 1st. It is in opposition with the sun on the 31st, and may be distinctly seen with the naked eye on a clear moonless night, but is hard to distinguish from faint stars. By making two or three sketches, at intervals of a few days, of the stars visible with an opera-glass southeast of Jupiter, the planet may be identified by its slow westward motion. Its greenish color, visible in a field-glass, aids the search. Neptune is in Taurus, too near the sun to be observed.

THE MOON.

First quarter occurs on the afternoon of the 6th, full moon on that of the 14th, last quarter on the evening of the 21st, and new moon (accompanied by the solar eclipse) on the 28th. The moon is farthest from the earth on the night of the 8th, and nearest on the afternoon of the 24th.

The moon is in conjunction with Venus, though not closely, near noon on the 2d, with both Jupiter and Uranus on the afternoon of the 15th, with Saturn on that of the 17th, Mars on the morning of the 27th, Mercury on that of the 28th, a few hours before the eclipse, and finally with Venus again on the afternoon of the 31st.

Princeton University Observatory, April 21, 1900.